5 Water and Wastewater Systems

Introduction

This section provides a comprehensive overview of the existing facilities that comprise Plaquemines Parish's water and wastewater systems. This section also discussions the various methods utilized to perform more detailed analysis of the conditions of those facilities for the purpose of the formulation of a Capital Improvements Program (CIP) for water and wastewater facilities. Also included within the section is a discussion of the existing financial position of the water and wastewater systems enterprise fund.

The Water and Wastewater Systems element of the Community Assessment – Technical Addendum section is organized as follows:

5.1 Water System Assessment
5.2 Wastewater System Assessment
5.3 Financial Assessment

5.1. Water System Assessment

a. Purpose

The purpose of the Water System Assessment is to evaluate the current water infrastructure in order to assess the system's immediate needs, capability to sufficiently service future development, and the system's overall sustainability. It is not the intent of this element to provide an in-depth technical analysis of the Parish's water infrastructure. Rather, it is the intent of this element to identify needs and identify "big picture" ideas to provide a sustainable future for the Plaquemines Parish Water System. This assessment is developed based upon interviews with various stakeholders as well as reviews of previous studies commissioned by Plaquemines Parish, including *Joint Use Sewer – Water System Feasibility Study* prepared by Burk – Kleinpeter, Inc. (BKI) in 2004 and *Plaquemines Parish Water and Sewer Planning for Plaquemines Parish Government* prepared by Linfield, Hunter, and Junius, Inc. (LH&J) in 2002.

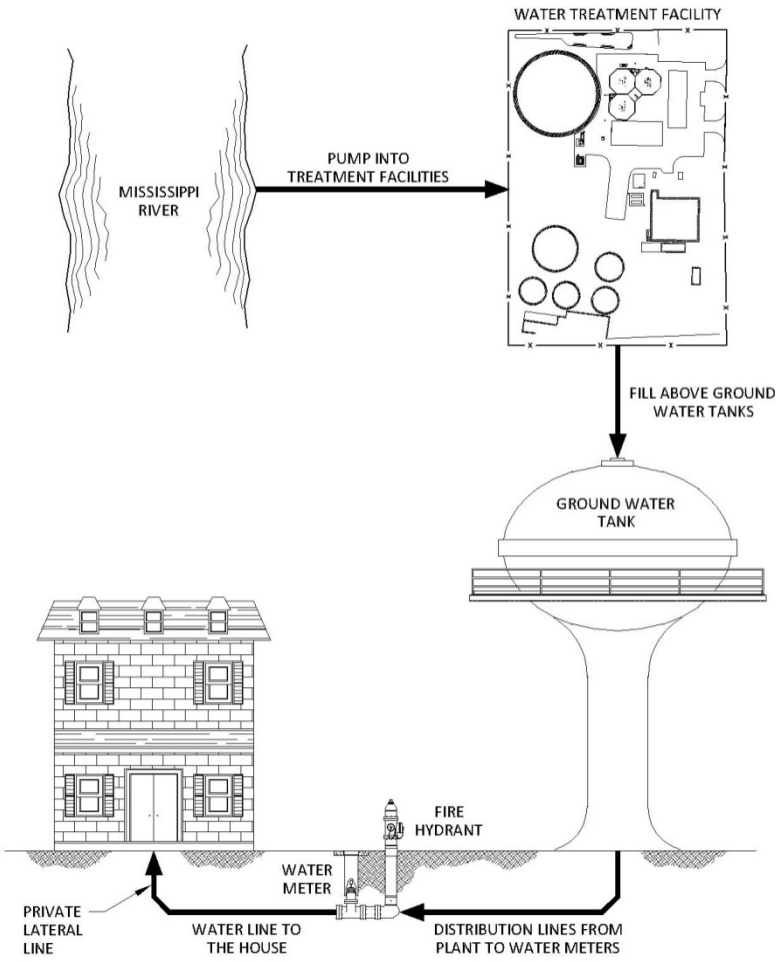
b. Existing Water Treatment Systems

Currently, Plaquemines Parish owns, maintains, and operates five (5) domestic water treatment facilities (WTPs). These WTPs are listed below along with their daily treatment capacities:

Domestic Water Treatment Facilities in Plaquemines Parish (WTPs)		
WTP	Location	Daily Treated Water Production Capacity (Million Gallons per Day [MGD])
Belle Chasse WTP	Belle Chase	7.5
Port Sulphur WTP	Port Sulphur	4.0
Boothville WTP	Boothville	2.0
Dalcour WTP	Dalcour	1.0
Pointe ‘à la Hache WTP	Pointe ‘a la Hache	0.5
TOTAL PARISHWIDE DOMESTIC WATER PRODUCTION CAPACITY		15.0

All of the above WTPs are operated and maintained by a private contractor, Severn Trent Services (STS). *Plaquemines Parish Water and Sewer Planning for Plaquemines Parish Government* prepared by Linfield, Hunter, and Junius, Inc. (LH&J) in 2002 indicated that the investment in Plaquemines Parish Water Facilities had been a point of emphasis to the Parish and that performance at that time had increased since the early 1990’s.

All of the above WTPs utilize the Mississippi River as raw water supply due to the abundant supply of fresh water and the lack of other immediately accessible surface waters for treatment and distribution of potable water.

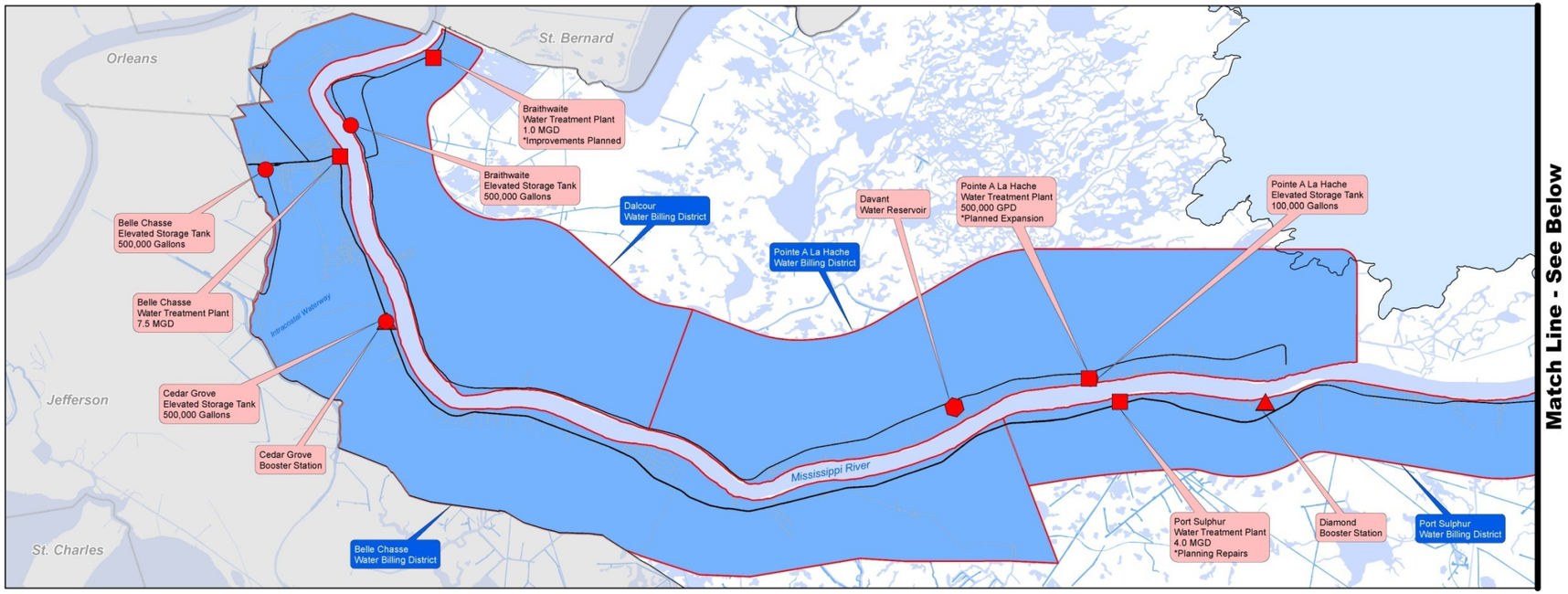


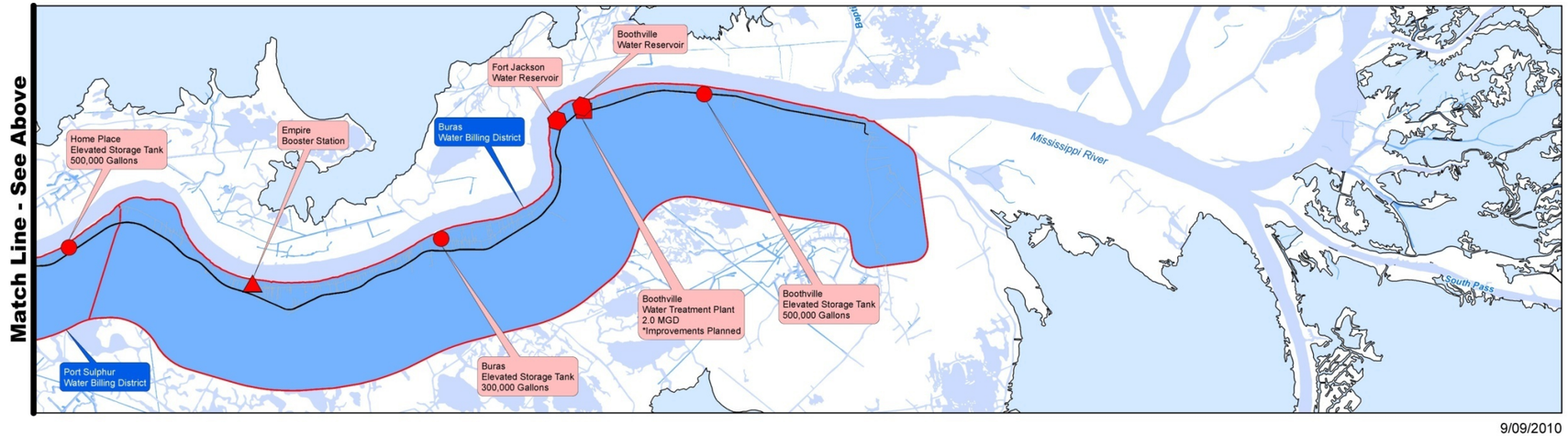
Typical Water Treatment and Distribution Scheme, Plaquemines Parish

A unique operational challenge to the Boothville WTP, Point a la Hache WTP, and Davant WTP is the need to maintain raw water reserves to allow for continued water treatment and distribution during periods of salt-water intrusion up the Mississippi River at each plant's raw water intake pumps. During these times, the plants must rely on treatable water provided by barge or water treated at other WTPs.

The map below provides an overview of water service areas and treatment facilities.

This page was intentionally left blank for two-sided printing.





9/09/2010

Water Treatment Plants
and Storage Tanks

Comprehensive Master Plan
Plaquemines Parish,
Louisiana

Legend

- **Enclosed Storage Facility**
- **Pump Station**
- **Treatment Plant**
- **Water Districts**

0 13,000 26,000 52,000 Feet

Represents back of map

c. Compliance with Regulatory Requirements

Currently, all Plaquemines Parish WTPs meet regulatory requirements. These requirements are as dictated by the 1974 Safe Drinking Water Act. Subsequent amendments in 1986 and 1996 increased water quality requirements and enacted reporting requirements for most communities.

The most common area of non compliance for most communities, like Plaquemines Parish, that utilize surface water treatment facilities is the Disinfection Byproducts Rule. This regulation limits the quantities of trihalomethanes (THMs) and haloacetic acids (HAAs) that can be present within domestic drinking water. Both THMs and HAAs are thought to be carcinogens, or cancer causing. Both are present in domestic drinking water as by-products of disinfection methods that utilize chlorine. The best method for reducing the occurrence of THMs and HAAs within domestic drinking water is to reduce the amount of organic matter within the treated water chemistry and/or reduce the amount of time by which THMs and HAAs have to form (i.e., reduce water age). Given that Plaquemines Parish currently meets the disinfection by-products rule, we can conclude that the quality of the treated water prior to disinfection is high since water age within the Plaquemines Parish water distribution system is thought to be high given the required length of distribution lines.

Compliance with the Disinfection Byproducts Rule is monitored yearly and the results must be published within a Consumer Confidence Report distributed by Plaquemines Parish.

d. Future Concerns related to Plaquemines Parish WTP Facilities

A simple comparison of the Parish's wastewater treatment capacity with the Parish's water treatment capacity is a good way to determine if day-to-day capacity of either system needs to be addressed. Currently, the Parish WTPs can produce approximately 15.0 MGD of domestic water and the Parish WTPs can treat approximately 14.74 MGD of domestic sewage. These numbers appear to be in line with industry standards as sewage treatment capacity should typically be approximately 90% of the water treatment capacity. The remaining 10% discrepancy is due to consumption, irrigation, and water loss within the distribution and collection systems.

The only remaining major future concern for the domestic water treatment facilities within Plaquemines Parish is maintenance of mechanical, electrical, and structural systems within the WTPs. Several projects have been identified by interviews with stakeholders and review of previous studies as priorities and are identified in the Community Agenda.

While the maintenance of several WTP facilities separated geographically certainly poses some operational challenge, experience has shown that this arrangement generally works to the advantage of Plaquemines Parish. Given the threats to the raw water supply posed by hurricanes, chemical spills, and salt water intrusion within the Mississippi River, the current scheme of smaller WTP facilities distributed along the length of the Parish appears to be prudent from a redundancy standpoint. Under the current scheme, a spill at the intake of one WTP would cause the closure of just that one WTP and, therefore, not result in a Parish-wide

water outage. To further this scheme of redundancy within the water system, significant consideration should be given to network (or "loop") the water distribution system throughout the Parish to allow for closure of WTP facilities and minimize service disruptions throughout the system. This will be discussed further in the subsequent paragraphs pertaining to the domestic water distribution system.

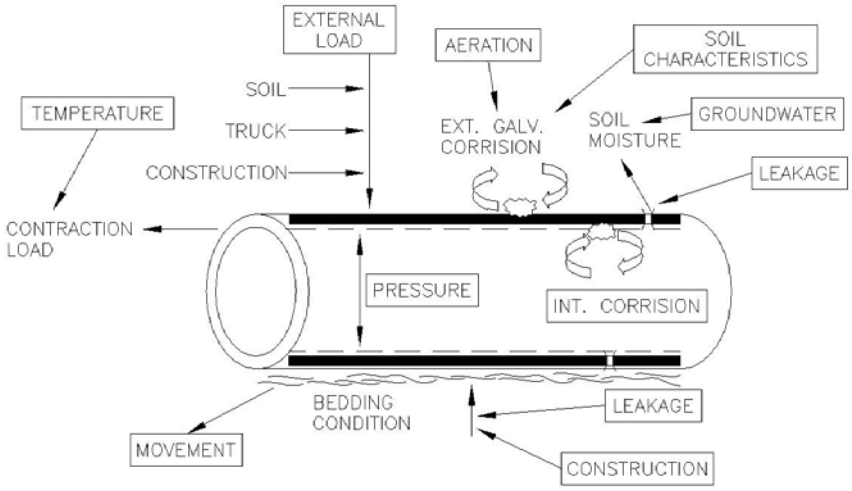
e. Existing Water Distribution Systems

Plaquemines Parish currently operates and maintains the following major water distribution system assets:

- 8,719 Water Meters (7,723 residential; 1,100 commercial; and 96 public)
- >300 Miles of Water Distribution Mains
- 1,989 fire hydrants
- Seven (7) Elevated Storage Tanks:
    - Engineer's Road / Belle Chasse (500,000 gallons)
    - Cedar Grove (500,000 gallons)
    - Home Place (500,000 gallons)
    - Buras (300,000 gallons)
    - Boothville (500,000 gallons)
    - Pointe à la Hache (100,000 gallons)
    - Braithwaite (500,000 gallons)

- Three (3) Water System Booster Stations
    - Cedar Grove
    - Diamond
    - Empire

The water distribution system is maintained by a private contractor, Severn Trent Services (STS). As detailed in *Plaquemines Parish Water and Sewer Planning for Plaquemines Parish Government* prepared by Linfield, Hunter, and Junius, Inc. (LH&J) in 2002, the majority of Plaquemines Parish's original potable water distribution system was installed in the 1950's and included predominantly cast iron water lines of 4 to 6 inches in diameter. Later improvements in the 1970's included larger lines manufactured of asbestos cement (AC) pipe. Since the 1990's, the Parish has completed several improvements projects as part of regular maintenance and the Salt Water Mitigation Program. These lines have been constructed primarily of large diameter polyvinyl chloride (PVC) pipe. As the cast iron pipes have aged, STS's operators have noticed increasing breaks and problems with "red water", where iron oxide from degradation of the cast iron pipe enters the potable water system. These problems generally exist in the Belle Chasse area, one of the first heavily populated areas of the Parish. STS has also noted breakages in AC pipelines.



Typical Modes of Pipeline Failures

A significant item of concern in the configuration of the existing system is the lack of system interconnectivity between both adjacent Parishes and the east bank and west banks of the Parish. While the east bank water systems and west bank water systems are connected to each other, there is currently no provision which connects the systems on opposite banks of the Mississippi River. Therefore, catastrophic events such as a flood can lead to water service outages until plants can be repaired. St. Charles Parish recently installed an underwater water line crossing across the Mississippi River, which connects the east and west banks of that Parish, allowing for water to be supplied between the two. A similar project is under design in St. James Parish, and it is likely that other Parishes with similar geographic arrangements will likely study and pursue similar installations.

The potential interconnection between Plaquemines and water systems operated by adjacent political jurisdictions has been studied extensively in recent years. *Plaquemines Parish Water and Sewer Planning for Plaquemines Parish Government* prepared by Linfield, Hunter, and Junius, Inc. (LH&J) in 2002 recommended the installation of interconnections between the Plaquemines Parish potable water distribution system and the Orleans Parish system on the west bank and the St. Bernard Parish system on the east bank to supplement the existing interconnect on the west bank which connects the Plaquemines system to the Jefferson Parish potable water distribution system. In addition, these items were studied further in BKI's 2004 *Use Sewer – Water System Feasibility Study.*

f. Compliance with Regulatory Requirements

Most regulatory requirements pertaining to domestic drinking water are related to the quality of the water itself. Compliance with those requirements was addressed within the section on the water treatment plants. However, there are a few standards which should be adhered to with the distribution system. Those are:

- Water Loss (up to 25% is typical for municipal systems in Southern Louisiana)
- Water System Pressure (minimum of 15 psi, 60-70 psi preferred)
- Fire protection requirements (pressure and flow)

Water loss is generally attributed to leaks within the distribution system, non-billed water (legally or illegal unmetered water connections), fire fighting, and flushing. Generally, municipal systems in Southern Louisiana can expect to have water loss of up to 25% due to unstable soils and aging water distribution systems. In general practice, water loss rate higher than 25% warrants investigation into enactment of measures to reduce water loss through leak identification and repair programs. For comparison, the City of New Orleans has experienced losses greater than 40%.

The Louisiana Department of Health and Hospitals requires that water pressure within the water distribution system be maintained at a lever higher than 15 psi at all times. Failure to maintain this minimal pressure will result in a "boil water advisory" through which citizens are advised to boil water prior to ingestion to eliminate any potential bacteria that may have entered into the water system due to low pressure. Practically, a water system pressure of 60-70 psi should be maintained for customer convenience.

Fire protection requirements are chiefly dictated by the insurance industry. Depending upon the fire load of a particular building or development, the available pressure and flow for firefighting purposes is typically tested prior to construction to determine that building or development's insurance rating. Obviously, the more pressure and flow available for firefighting purposes will lower insurance rates and therefore lead to a more favorable business environment. Also, some chain type stores ("big box" stores such as Home Depot and Wal Mart) require a minimum pressure and flow from the water distribution system in order to consider a potential site for development.

The above three standards are difficult to monitor through routine field observations as they are all dependent upon water flow and pressure at any given time. Since these variables are constantly changing within a water distribution system due to demand with the system, prediction of water pressure and flow within the system is impossible without the use of a computerized hydraulic model.

g. Future Concerns related to Plaquemines Parish Water Distribution Systems

The main concern facing the water distribution system is system redundancy and the availability of interconnections with adjacent districts to provide for service during disasters or outages. Flexibility of the water distribution system is critical to the Parish's ability to respond to natural and man-made disasters that may limit the ability for any one or several of the existing WTPs to operate. Improving the systems flexibility through looping and interconnections is necessary for the Parish to be able to respond to such events or even enact scheduled outages for maintenance. A discussion of potential remedies to these concerns is presented within the Community Agenda.

2. Wastewater System Assessment

a. Purpose

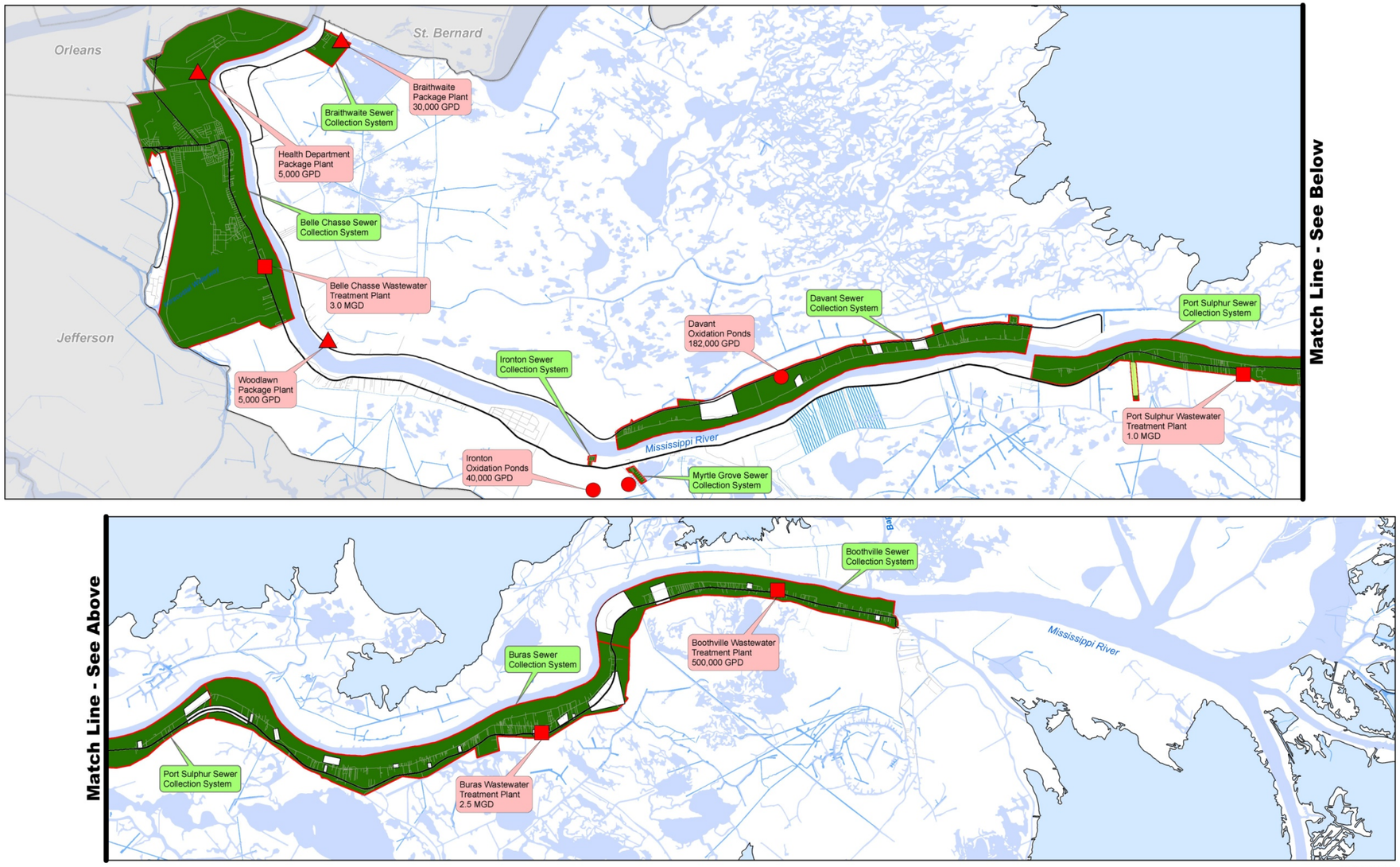
The purpose of the Wastewater System Assessment is to evaluate the current wastewater infrastructure in order to assess the system's immediate needs, capability to handle future development, and overall sustainability.

It is not the intent of this element to provide an in-depth technical analysis of the Parish's water infrastructure. Rather, it is the intent of this element to identify needs and identify "big picture" ideas to provide a sustainable future for the Plaquemines Parish Water System. This assessment is developed based upon our interviews with various stakeholders as well as reviews of previous studies commissioned by Plaquemines Parish, including *Joint Use Sewer – Water System Feasibility Study* prepared by Burk – Kleinpeter, Inc. (BKI) in 2004 and *Plaquemines Parish Water and Sewer Planning for Plaquemines Parish Government* prepared by Linfield, Hunter, and Junius, Inc. (LH&J) in 2002.

b. Existing Wastewater Treatment Systems

Currently, Plaquemines Parish maintains and operates eight (8) mechanical wastewater treatment plants (WWTPs) and two (2) Oxidation Ponds. These plants vary in type and process. Currently, the Parish operates five (5) trickling filter plants, three (3) activated sludge plants, and two (2) oxidation ponds. These are listed in the below table:

This page was intentionally left blank for two-sided printing.



9/09/2010

Sewer Treatment Plants
and Package Plants

Comprehensive Master Plan
Plaquemines Parish,
Louisiana

Legend

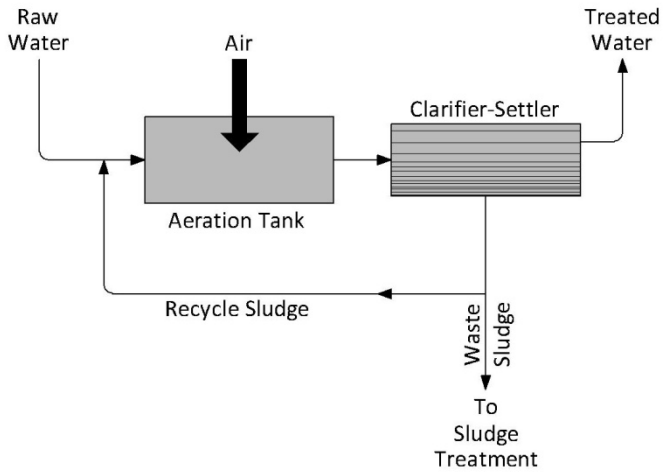
- Oxidation Pond
- Package Plant
- Treatment Plant
- Sewered Area
- Un-Sewered Area
- Low Pressure Sewer System

N W E S

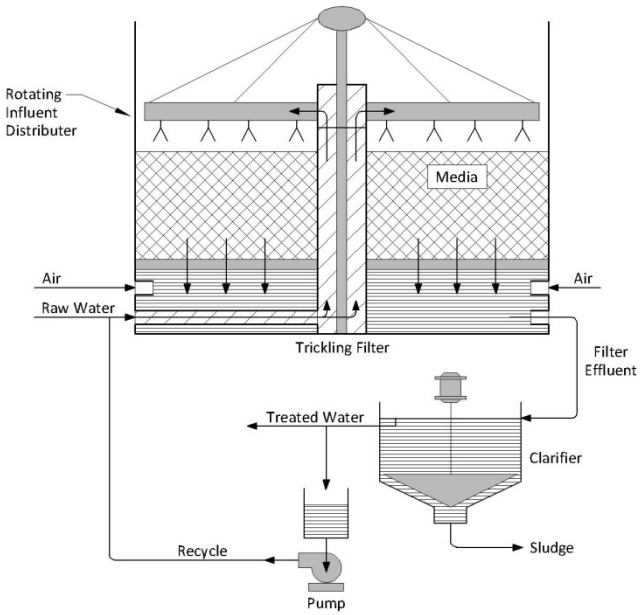
0 11,000 22,000 44,000 Feet

Represents back of map

Wastewater Treatment Facilities (WWTPs) in Plaquemines Parish			
WWTP Name	WWTP Location	WWTP Capacity (Permitted Average Daily Flow, Million Gallons per Day)	WWTP Type
Belle Chasse	Belle Chasse, LA	3.0 MGD	Trickling Filter
Port Sulphur	Port Sulphur, LA	1.0 MGD	Trickling Filter
Buras	Buras, LA	2.5 MGD	Trickling Filter
Boothville	Boothville, LA	0.5 MGD	Trickling Filter
Davant	Davant, LA	0.2 MGD	Trickling Filter
Braithwaite	Braithwaite, LA	0.030 MGD	Activated Sludge – Package Type
Woodlawn	Woodlawn, LA	0.005 MGD	Activated Sludge – Package Type
Parish Health Unit	Belle Chasse, LA	0.005 MGD	Activated Sludge – Package Type
Ironton Oxidation Pond	Ironton, LA	0.040 MGD	Oxidation Pond
Myrtle Grove Oxidation Pond	Myrtle Grove, LA	0.040 MGD	Oxidation Pond
TOTAL PARISH CAPACITY		7.29	MGD



Typical Activated Sludge Process Schematic



Typical Trickling Filter Process Schematic

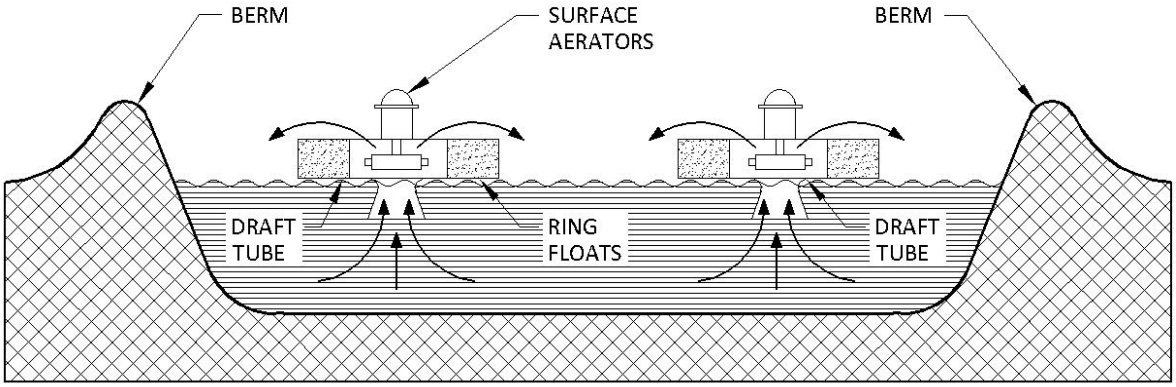
Due to the remote nature of some areas of Plaquemines Parish, several privately owned and operated package WWTPs exist throughout the Parish servicing remote residences, business, and industry. Those facilities will not be addressed in this report as they are not operated by the Parish and therefore not considered Parish assets.

c. Compliance with Regulatory Requirements

We are currently unaware of any current or pending compliance actions undertaken by the United States Environmental Protection Agency (EPA) or the Louisiana Department of Environmental Quality (LDEQ) against Plaquemines Parish. It appears as though the Parish's contract operator, Severn Trent Services, has done an adequate job of maintaining compliance with wastewater discharge permits issued by LDEQ.

All of the above listed Trickling Filter type plants discharge treated wastewater into the Mississippi River while the remainder of the Package Type WWTPs and Oxidation Ponds typically discharge into a nearby small bayou or drainage canal. Most water bodies across the United States are facing increasing restrictions on the amount of pollutants that may be discharged into the water body daily. This has caused increasingly stringent pollution discharge limits to be placed on WWTPs across the United States thus requiring significant improvements to the treatment processes to attain more stringent discharge limits. However, the sheer volume and flow rate of the Mississippi River in Plaquemines Parish allows for discharge limits to remain relatively high and basically unchanged since they were first implemented in the early 1980's. We do not anticipate that stricter discharge limits will be implemented for these plants in the foreseeable future, so improvements to the treatment processes should not be necessary from the standpoint of

maintaining compliance with the discharge water quality requirements set by regulatory agencies (i.e., the United States Environmental Protection Agency and the Louisiana Department of Environmental Quality.



Typical Oxidation Pond Schematic

The same cannot be said, however, for the remaining package type WWTP's and oxidation ponds. Generally speaking, the smaller and lower the flow in the receiving water body, the more stringent the wastewater discharge limits are. It is reasonable to expect that discharge limits on these small WWTP's and oxidation ponds will become more stringent with time thereby requiring capital investments into improving the treatment processes if these WWTP's are to be kept on line and within compliance with the regulatory agencies discharge permit requirements.

d. Future Concerns

Three major concerns face Plaquemines Parish WWTP facilities in the future. These are:

- Need for major rehabilitation / replacement of existing WWTP facilities (end of design life)
- Need for expansion of existing WWTP facilities to accommodate future growth in Infiltration and Inflow (I&I) into the aging sewerage system
- Compliance of smaller treatment facilities with increasingly stringent discharge limits

Several projects have been identified by interviews with stakeholders and review of previous studies as priorities and are identified in the Community Agenda.

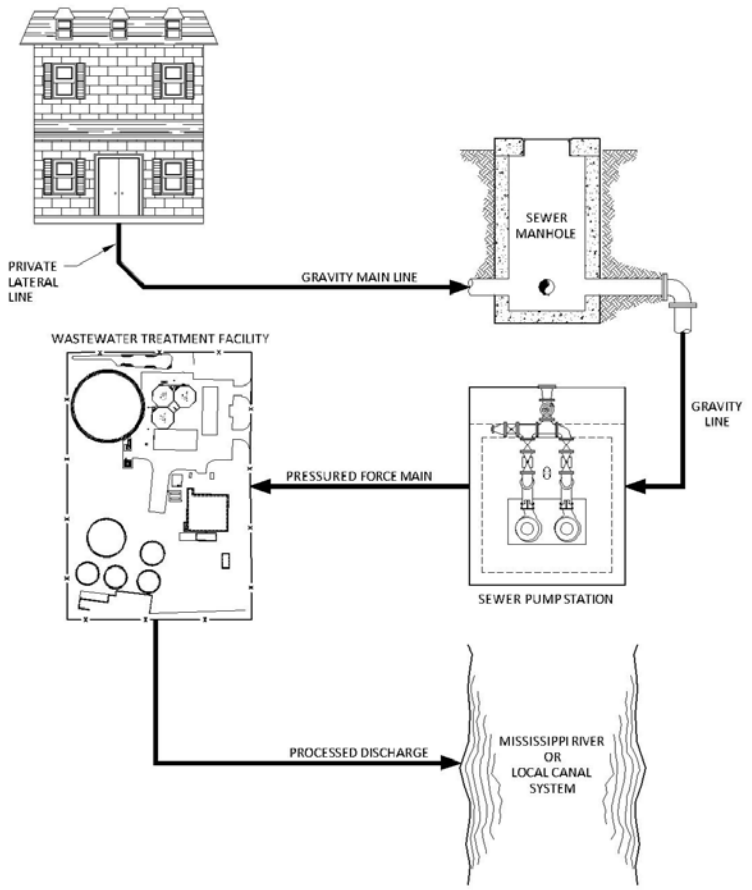
e. Existing Wastewater Collection Systems

Plaquemines Parish current operates and maintains the following major sewage collection system assets:

- 135 sewer lift stations with 260 pumps
- 104 miles of gravity sewer pipelines
- >50 miles of sewer force mains

The sewage collection system is currently maintained and operated by a private contract, Severn Trent Services.

Approximately 100 of the 135 sewer lift stations are currently in various states of repair as a result of damage incurred during Hurricane Katrina. As a result, Plaquemines Parish will be in the unique position of having relatively new sewer pump station facilities over the next decade. While these repairs are generally funded by disaster recovery public assistance funding which generally limits the scope of the repairs to the pre – storm configuration of the station, these stations will function better as a whole than they have for years.



Typical Sewage Collection and Treatment System

Like most communities in South Louisiana, Plaquemines Parish suffers from a severe Inflow and Infiltration (I&I) problem within its sewage collection system. Inflow is water that enters the collection system through illicit connections, often drains located on residential properties that have been connected to the sanitary sewer system without permit. Infiltration is defined as water that enters the collection system through breaks and cracks within the collection system pipes and service connections. Because the groundwater table throughout South Louisiana is relatively high and severe rain events often

lead to saturated ground conditions, any cracks or breaks in sewage collection lines allow for storm water to enter the system thereby increasing the flows, unnecessarily, to the wastewater treatment facilities.

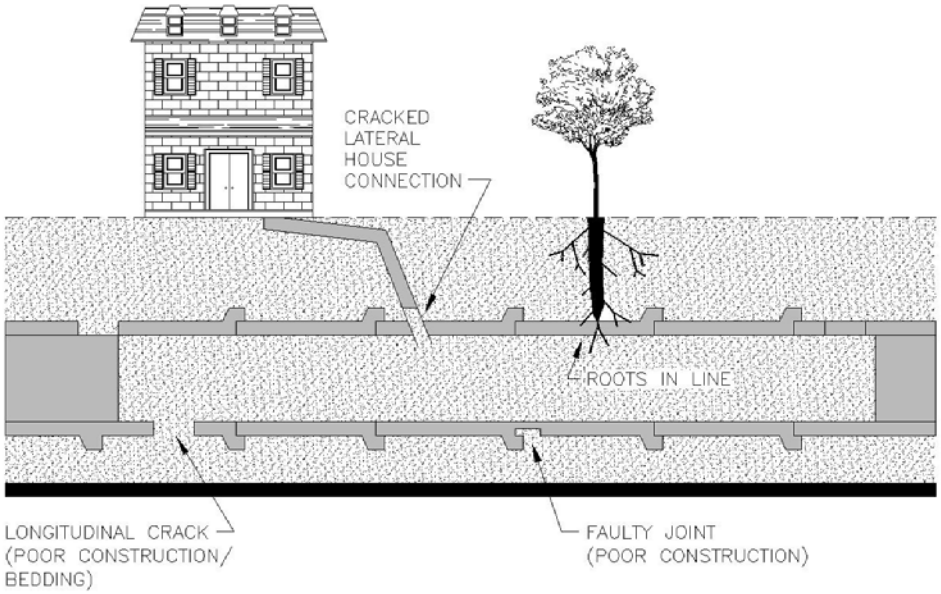
f. Compliance with Regulatory Requirements

Within the last decade, the Louisiana Department of Environmental Quality (LDEQ) has begun the process of citing systems that maintain excessive wet-weather peak flows at the wastewater treatment plants. LDEQ maintains that excessive wet-weather flows can be attributed to lack of maintenance within the sewage collection system. Recently, many communities have been presented with Compliance Orders mandating that repairs to the sewage collection system be enacted to reduce wet-weather peak flows. Currently, Plaquemines Parish is not under any such Compliance Order.

Plaquemines Parish Water and Sewer Planning for Plaquemines Parish Government prepared by Linfield, Hunter, and Junius, Inc. (LH&J) in 2002 indicated that due to I&I in the collection system, the Belle Chasses, Port Sulphur, and Buras WWTP's exceeded their design capacity 12, 19, and 7% of the time. The Boothville plant exceeded its capacity 40% of the time due to I&I problems. The report indicated that the focus of future corrective measures should reduction of inflow instead of increases in pumping capacities throughout the collection system.

Historically, Plaquemines Parish has been proactive with respect to addressing I&I concerns. The Parish has implemented a program of funding annual contracts to address areas of the sewage collection system that have been identified as generating excessive I&I.

Another area of concern with respect to regulatory compliance of the sewage collection system is the capacity and reliability of the sewer lift stations to convey wastewater from the gravity collection system to the wastewater treatment plants. Inadequate capacity of sewer lift



Typical Sources of I&I

stations is a common concern with regard to prevention of sewage overflows from the collection system. Since the majority of the sewer lift stations will be substantially rehabilitated or replaced due to damage incurred during Hurricane Katrina, these concerns should be minimal as each station will be evaluated and new equipment selected during design to handle the current demands on the station as sound engineering practice.

g. Un – Sewered Areas

The Parish currently has several areas which are not served by sewerage facilities. These areas were identified as the following by *Plaquemines Parish Water and Sewer Planning for Plaquemines Parish Government* prepared by Linfield, Hunter, and Junius, Inc. (LH&J) in 2002.

- Undeveloped areas near Woodland Highway in Belle Chasse
- Cedar Grove to La Reussite on the West Bank
- West Pointe a la Hache and Pointe Celeste
- Nairn to Venice on the West Bank
- Braithwaite to White Ditch on the East Bank
- Phoenix to Bohemia on the East Bank

The lack of sewerage in these areas presents an environmental and quality of life concern. These areas should be provided with sewerage service to ensure that wastewater is properly collected, treated, and discharged to the environment.

g. Future Requirements

The Parish has identified several projects that are seen as vital to the continued successful operation of the sewage collection system. These are identified in the Community Agenda Element.

3. Financial Assessment

Funding sources for water and sewer related capital projects can come from a variety of sources. Given the multitude of needs facing Plaquemines Parish with respect to maintenance and upgrade of its sewer infrastructure, analysis of the current financial status of the system is necessary. Given the results of this analysis, we will recommend steps that should be taken to allow for future investment in the sewer system and long-term sustainability of water and sewer services.

a. Analysis of the Current Situation

Water and sewer services for Plaquemines Parish are provided by a private company, Severn Trent and funded through the Water and Sewer Enterprise Fund. In 2009 the parish collected $3.7 million in water and sewer revenues in the Enterprise Fund to cover expenses of $11.4 million, including depreciation. The contractor was paid $7.9 million. After recognizing a net

operating loss of $4.4 million, the parish used $3.3 million in property tax revenue and $1.1 million in other revenues to cover the loss.

One of the basic economic principles applicable to the operation of public utilities, whether publicly owned or investor owned, is that utilities should be operated as independent enterprises. The corollary is that public water and sewer systems should minimize reliance on general funds from the general fund sources and instead should charge customers the full cost of providing utility services.

A second fundamental principle indicates that utilities should strive to recover their costs in an equitable manner by analyzing consumption patterns and then setting rate schedules that avoid "cross-subsidies" between customer groups. Such subsidies provide a benefit to some by shifting costs to others with no underlying economic justification. Costs should be recovered from individual customers or classes in proportion to the services provided. The provision of any service or capacity to a customer or group of customers at charges less than the actual costs incurred results in the remaining costs being recovered from other customers through the imposition of higher charges than actual costs of service. This shift in cost recovery creates a reduction in equity. The result of this inequity is ultimately an inefficient allocation of resources as the subsidized customer or group over-consumes, and all remaining customers inappropriately constrain their consumption because they are being "overcharged".

c. Analysis of Existing Water and Sewer Rates

Generally speaking, most communities rely on user service fees to cover the costs of operation of the water and sewer systems. Typically, funds for capital projects are provided through sales tax revenues which can fluctuate widely depending upon economic conditions. Ideally, the user service fees would allow for the funding of a capital projects account which would be used for major maintenance projects and upgrades necessary to meet regulatory and capacity demands. Water and sewer rate structures vary greatly from community to community. Therefore, a "side-by-side" comparison of rates can be very difficult. The best way to compare the user fees from community to community is to employ the "average household bill" method. This method involves the estimation of a household's typical monthly consumption and then computing the corresponding user fees associated with that consumption. This allows us to compare what the typical household's utility bill would be from community to community.

First, we assume that the average household in Southeast Louisiana contains approximately 3.5 people and each person consumes water at home at an average rate of 75 gallons per capita per day:

> (3.5 persons per household) X (75 gallons/person/day) = 262.5 gallons per day per household

Assuming an average month contains 30 days, this would equate to an average monthly household consumption of:

(262.5 gallons per day per household) x (30 days) = 7,875 gallons per household per month

For simplicity, we would round this number to 8,000 gallons per household per month.
Using the current rate structure employed by Plaquemines Parish, the average household utility bill can be calculated as follows:

PLAQUEMINES PARISH AVERAGE HOUSEHOLD WATER AND SEWER BILL COMPUTATION

RESIDENTIAL RATE STRUCTURE

0 – 4,000 gallons:	$2.80 flat fee
4,001 – 20,000 gallons:	$2.00 per 1,000 gallons
20,001 – 40,000 gallons:	$2.50 per 1,000 gallons
Over 40,0001 gallons:	$3.00 per 1,000 gallons

AVERAGE HOUSEHOLD UTILITY BILL (assuming average household consumption of 8,000 gallons)

0 – 4,000 gallons:	$2.80 flat fee
4,001 – 8,000 gallons:	(4,000 gallons) x ($2.00 per 1,000 gallons) = $8.00

TOTAL AVERAGE HOUSEHOLD WATER AND SEWER BILL = $10.80

For comparison purposes, we have selected neighboring St. Bernard Parish, the City of Slidell, and the City of Gretna for comparison purposes. St. Bernard Parish has a larger population (40,000) but similar location, geography, and development patterns. St. Bernard Parish also utilizes similar types of facilities for the treatment of water and wastewater. The City of Slidell is an example of a community of similar size (30,000) which maintains a rate structure that allows for adequate funding of their water and sewer operations. The City of Slidell maintains wastewater treatment facilities with higher discharge limitations and also uses deep groundwater wells for domestic water supply. The City of Gretna is a community of smaller size (17,000) that utilizes similar facilities for water and wastewater treatment.

CITY OF SLIDELL AVERAGE HOUSEHOLD WATER AND SEWER BILL COMPUTATION

RESIDENTIAL RATE STRUCTURE

0 – 4,000 gallons:	$17.26 flat fee for water only
	$15.84 flat fee for sewer only
Over 4,001:	$1.67 per 1,000 gallons (water only)
	$2.98 per 1,000 gallons (sewer only for next 20,000 gallons)
	$2.50 per 1,000 gallons (sewer only for over 24,000 gal)

AVERAGE HOUSEHOLD UTILITY BILL (assuming average household consumption of 8,000 gallons)

0 – 4,000 gallons:	$17.26 flat fee for water only
	$15.84 flat fee for sewer only

4,001 – 8,000 gallons: (4,000 gallons) x ($1.67 per 1,000 gallons) = $6.68 for water
(4,000 gallons) x ($2.98 per 1,000 gallons) = $11.92 for sewer

TOTAL AVERAGE HOUSEHOLD WATER AND SEWER BILL = $51.70 per month

CITY OF GRETNA AVERAGE HOUSEHOLD WATER AND SEWER BILL COMPUTATION

RESIDENTIAL RATE STRUCTURE

0 – 2,000 gallons: $9.73 flat fee for water only
$10.38 flat fee for sewer only

Over 2,000: $3.30 per 1,000 gallons (water only)
$3.79 per 1,000 gallons (sewer only)

AVERAGE HOUSEHOLD UTILITY BILL (assuming average household consumption of 8,000 gallons)

0 – 2,000 gallons: $9.73 flat fee for water only
$10.38 flat fee for sewer only

2,000 – 8,000 gallons: (6,000 gallons) x ($3.30 per 1,000 gallons) = $19.80 for water
(6,000 gallons) x ($3.79 per 1,000 gallons) = $22.74 for sewer

TOTAL AVERAGE HOUSEHOLD WATER AND SEWER BILL = $62.65 per month

Monthly Average Household Water and Sewer Bill Comparison

The below table compares the Average Household Water and Sewer Bills for Plaquemines Parish, the City of Slidell, St. Bernard Parish, and the City of Gretna:

Community	**Monthly Average Household Water & Sewer Bill (assuming consumption of 8,000 gallons per day per household)**
Plaquemines Parish Government	$10.80
City of Slidell, LA	$51.70
City of Gretna, LA	$62.65

The preceding exercise in comparing the monthly average household water and sewer bills is a way by which we can generally compare how Plaquemines Parish's current water and sewer rates relate to surrounding communities of similar sizes and conditions. Generally speaking, we can state that the rates charged by Plaquemines Parish Government for water and sewer services are significantly lower than the surrounding communities that we used for comparison.

That realization, coupled with the reality of a yearly deficit of approximately $4.4 million within the water and sewer enterprise fund, leads us to recommend that water and sewer rates be adjusted to fall closer in line with the actual costs of providing those services. The Parish also must be sensitive to what surrounding communities are charging for similar services.
For general discussion purposes only, we can assume that adjusted water and sewer rates would result in a Monthly Average Household Water and Sewer Bill of approximately $50.00 per month. Several simplifying assumptions can be made to determine what revenue might be expected from the adjusted rates. Those are:

- $50.00 per month average monthly household bill
- persons per household
- Domestic (household) consumption is approximately 75% of total water consumption. The remaining 25% is commercial and industrial.
- Assume that commercial and industrial rates structures are generally similar to the residential rate structure

Using the above simplifying assumptions, we can compute the average bill per person of water and sewer services as follows:

- $50.00 per month per 3.5 persons = $14.28 per person for household consumption
- Commercial consumption per person = $14.28 per person (household consumption) x 25%

Commercial consumption per person = $3.57 per person (commercial consumption)
Total average bill per month per person = $14.28 / person (household) + $3.57 / person (commercial) = $17.85 per person per month
The 2010 population of Plaquemines Parish was 22,440 persons. Using this population as a basis for our estimation, the yearly anticipated revenue to the water and sewer enterprise fund would be:

(22,440 persons) x ($17.85 per person per month) x (12 months) = $4,806,648

The estimated yearly revenue to the water and sewer enterprise fund would be approximately $4.8 million. Currently, the Parish pays Severn Trent approximately $7.9 million for “turn-key” operations and maintenance services. Should the costs aspects of the equation remain the same, this would result in an annual deficit of $3.1 million. While the above computation is merely an estimate and utilizes some very broad assumptions, it is a good example of how water and sewer rates relate to the actual costs of operating and maintaining water and sewer utilities. It also should be noted that revenue is only one side of the overall equation. The costs incurred by the Parish for the operations and maintenance must be accounted for and spent in a cost efficient manner. In our opinion, both sides of the equation must be addressed by Plaquemines Parish for the water and sewer enterprise fund to be balanced and sustainable into the future.